

CLAIMS

WE CLAIM:

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1. A computerized method for creating test item models and generating test item variants comprising the steps of:

5 a. obtaining a test item;

 b. creating a model by;

 i. identifying elements of the test item to be variabilized;

 ii. variabilizing the elements to create variables;

10 iii. defining the variables;

 c. generating a test item variant using a simultaneous constraint solver.

2. The method according to claim 1, wherein said model creation further comprises specifying constraints that define the relationship among the variables.

3. The method according to claim 2 further comprising the step of accepting and retrievably storing the test item variant.

4. The method according to claim 3 further comprising the step of accepting and retrievably storing the test item model.

20 5. A computerized method for generating test item variants, the method comprising:

 b. identifying elements of a test item or a test item model to be variabilized;

 c. variabilizing the identified elements;

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d. defining the variables;
e. specifying constraints;
f. using a simultaneous constraint solver to determine
values for the variables;
5 g. generating test item variants.

6. A computerized system for generating test item variants from
test item models comprising:

10 c. means for retrievably storing test item models;
b. means for selecting a test item model;
c. means for simultaneously solving test item model
constraints;
d. means for generating test item solutions by
simultaneously solving test item model constraints;
e. means for displaying, accepting and retrievably storing
15 valid test item solutions.

7. The computerized system of claim 6 further comprising:

20 a. means for obtaining a test item;
b. means for identifying elements of the test item to be
variabilized;
c. means for variabilizing the elements to create
variables;
d. means for defining the variables;

e. means for accepting the variabilized test item with defined variables as a test item model.

8. The computerized system of claim 7 further comprising means for specifying constraints that define the relationship among he
5 variables.

9. The computerized system of claim 8 further comprising implementation of the VISUAL BASIC SOURCE CODE set forth in the VISUAL BASIC SOURCE CODE APPENDIX.

10. The computerized system of claim 8 further comprising implementation of the PROLOG SOURCE CODE set forth in the PROLOG SOURCE CODE APPENDIX.

11. The computerized system of claim 6 further comprising means for displaying, accepting and retrievably storing the test item model.

15. 12. A computerized system for generating test item variants comprising:

- a. means for creating, editing and storing variabilized and non-variabilized test items;
- b. means for selectively variabilizing test item elements;
- c. means for defining test item element variables;
- d. means for simultaneously solving variabilized test item element constraints;
- e. means for displaying and storing accepted test items.

13. A computerized method for generating test item variants from test item models comprising:

- a. retrievably storing test item models;
- b. selecting a test item model;
- c. simultaneously solving test item model constraints and generating test item solutions;
- e. displaying, accepting and retrievably storing valid test item solutions.

14. The computerized method of claim 13 wherein the step of

10 ☐ retrievably storing test items models comprises:

- a. obtaining a test item;
- b. identifying elements of the test item to be variabilized;
- c. variabilizing the elements to create variables;
- d. defining the variables;
- e. accepting the variabilized test item with defined variables as a test item model.

15. The computerized method of claim 13 further comprising specifying constraints that define the relationship among the variables.

16. The computerized method of claim 14 further comprising the steps of displaying and retrievably storing the accepted test item model.

17. The computerized method of claim 14 wherein the test item model constraints are simultaneously solved using PROLOG IV and TCA constraint language.

18. The computerized method of claim 17 wherein the Prolog 5 simultaneous constraint solver is the PROLOG SOURCE CODE set forth in the PROLOG SOURCE CODE APPENDIX.

19. The computerized method of claim 14 wherein variables can be defined by values which are variables.

20. The computerized method of claim 15 wherein the variables 10 are new variables for which new constraints are defined as needed.